

REMARKS

Claims 1-25 are pending in the application and are at issue.

Claim 1 has been amended to recite that the claimed gel coat resins provided by a *specific* addition of ingredients. This amendment is supported by originally-filed claim 22, for example. Support for an aliphatic hydroxyl-terminated oligoester not recited in claim 1 can be found in the specification at page 8, lines 23-25. Claims 2 and 22 have been amended to address the examiner's rejection under 35 U.S.C. §112, second paragraph, as being indefinite. These amendments are discussed below. Claim 4 has been amended to distinctly claim an aliphatic dicarboxylic acid or anhydride. Claim 5 has been amended to conform in scope to claim 1. Support for the amendments to claims 4 and 5 can be found in the specification at page 8, lines 23-25.

Claims 2 and 22-25 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite. In view of the amendments to the claims, and for the reasons set forth below, it is submitted that this rejection has been overcome and should be withdrawn.

In particular, claim 2 has been amended to delete the term "idealized". The claim now recites that the gel coat resin comprises a compound having the recited relationship between A, B, and C. This amendment does not effect the scope of the claims, and is presented solely to facilitate prosecution. Accordingly, the rejection of claim 2 under 35 U.S.C. §112, second paragraph, has been overcome.

Claims 22-25 stand rejected because of the terms "essentially" and "sufficient". With respect to the term "essentially," claim 22 has been amended to recite that the reaction is performed such that the free isocyanate groups present are less than 0.3%. Support for this amendment can be found at page 17, lines 22-25, of the specification. Accordingly, the rejection of claims 22-25 with respect to the term "essentially" has been overcome.

With respect to the term "sufficient," it is a well known and long used phrase in patent claims to delineate a term that can vary depending on the circumstances and wherein the scope is reasonably ascertained by a person skilled in the art. In claim 22, the

term “sufficient” is not indefinite because the “% free NCO groups” is now precisely recited, and the persons skilled in the art are well aware of temperature and time needed to achieve the “% free NCO groups” recited in the claims. The examples provide further guidance to persons skilled in the art as to the time and temperature required to achieve the recited “% free NCO group” feature of the claims. In addition, the determination of “% free NCO” also is a standard assay routinely performed by persons skilled in the art. Accordingly, it is submitted that the term “sufficient,” as used in claims 22-25 fully complies with 35 U.S.C. §112, second paragraph, and that the rejection should be withdrawn.

Claims 1-21 stand rejected under 35 U.S.C. §103 as being anticipated by McBain et al. U.S. Patent No. 5,777,053 ('053). Applicants traverse this rejection.

The examiner relies upon the '053 patent for disclosing a coating composition containing the same monomers in the same molar ratios as the claimed gel coat composition, and that the structure of claim 2 would be inherently possessed by the coating composition of the '053 patent. This contention is incorrect. A gel coat composition comprising the components (a), (b), and (c), and prepared as set forth in claim 1 differs from the in-mold coating composition of the '053 patent.

The '053 patent discloses polyester urethane acrylates at column 2, line 32 through column 3, line 12. The '053 patent specifically discloses the preparation of a saturated aliphatic polyester (column 2, lines 37-59), followed by a reaction with an aliphatic polyisocyanate (column 2, line 60–column 3, line 2). This reaction forms an isocyanate terminated polyester prepolymer (column 3, lines 2 and 3). This prepolymer *then* is reacted with a "hydroxyl alkyl acrylate"[sic] to form the polyester urethane having a (meth)acrylate at the terminal portions of the polymer (column 3, lines 4-7). The '053 patent discloses a very *specific* method of preparing the polyester urethane acrylate.

In contrast, the present claims recite a polyester urethane acrylate that is prepared by a substantially different method, which *cannot* provide the same reaction products as the method disclosed in the '053 patent, even *if* the *same* reactants are used. As stated above, the '053 patent discloses polyurethane acrylate resins made by preparing an

isocyanate-terminated polyurethane prepolymer, *then* reacting the prepolymer with a hydroxyalkyl acrylate to form the urethane resin.

In particular, a coating composition of the '053 patent is formed as follows. In a first step, a polyester intermediate A is made by reacting aliphatic dicarboxylic acids or anhydrides with glycols. For purposes of illustration, the polyester intermediate A is to be compared to (a) of the current claims (a hydroxyl terminated oligoester).

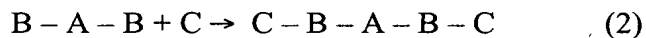
In a second step, the polyester intermediate A is reacted with an aliphatic polyisocyanate B. For purposes of illustration, the aliphatic polyisocyanate is to be compared with component (b) recited in claim 1 (a diisocyanate). An isocyanate terminated polyurethane prepolymer B – A – B therefore is formed.

In a third step, the isocyanate terminated polyurethane prepolymer B – A – B is reacted with with a hydroxyalkyl acrylate C to form a “saturated polyester urethane containing an acrylate” at the terminal positions of the chain. For purposes of illustration, the hydroxyalkyl acrylate can be compared to component (c) recited in claim 1 (a hydroxyalkyl (meth)acrylate).

The reaction of component “A” (the polyester intermediate) with component “B” (the aliphatic polyisocyanate) can be written as



Formula 1 shows that dihydroxyl functional A reacts with the isocyanate functional B, and the resulting structure terminates in B, because the ratio of isocyanate to hydroxyl is such to provide an isocyanate terminated prepolymer. Upon reaction of the prepolymer with the hydroxyalkyl acrylate (component “C”), it is seen that the resulting structure is:



because the hydroxy of component C reacts with the terminal isocyanate groups of B – A – B. Overall, the '053 patent teaches first forming an isocyanate functional prepolymer by reacting out all of the polyester and polyisocyanate to form a structure B – A – B, and then, after all of the hydroxyl groups of the polyester have reacted, adding a hydroxyl functional

hydroxyalkyl acrylate (C) and reacting it with the prepolymer to form the structure given in Formula 2.

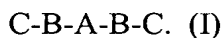
In contrast to, and in distinction from, the teachings of the '053 patent described above, the current claims recite resins with having different structures than those given in the '053 patent, and methods for making the present resins, that are patentably distinct over the resins and methods described above.

First, present claim 1 recites that the gel coat resin comprises reaction products of a reaction mixture comprising components (a) a hydroxyl terminated oligoester, (b) a diisocyanate, and (c) a hydroxyalkyl (meth)acrylate. That is to say, the gel coat resin of claim 1 is formed when *all three* components are individually present in a reaction mixture. The resulting structure of the claimed resin therefore is different from that disclosed in the '053 patent.

A clear difference between the '053 patent and the present claims is the recited presence of component C in the reaction mixture *before* all of components A and B have reacted. The consequence is that the present reaction mixture will contain species that are reaction products of the isocyanate compound with the hydroxyalkyl acrylate, designated as C – B – C. Formulation of such a reaction product is not possible in the method disclosed in the '053 patent.

The present specification clearly points out the difference in a structure between the presently claimed gel coat resin and the '053 patent disclosure. For example, at page 5, lines 22 through page 6, line 2, the present specification states:

“Accordingly, one important aspect of the present invention is to provide a urethane acrylate gel coat resin containing a reaction product of component A (oligoester), component B (diisocyanate), and component C (hydroxyalkyl (meth)acrylate), and having an idealized structure (I):



Notably, the reaction product of components A, B, and C *also contains other species in addition to idealized structure (I) and*

this invention is not limited to idealized structure (I)."
(emphasis added)

The present application also states at page 7, lines 15-24:

"A urethane-acrylate gel coat resin of the present invention has an idealized structure (I)

C-B-A-B-C, (I)

wherein (I) is the reaction product of an oligoester having M_w of about 200 to about 4,000 (A), a diisocyanate (B), and a hydroxyalkyl (meth)acrylate (C). *A urethane acrylate gel coat resin of the present invention is a reaction product of A, B, and C, thus other reactions species generally are present in addition to a resin of idealized structure (I).*" (emphasis added)

The structure of the reaction product recited in claim 1 is further described, for example at page 14, lines 21-28, of the specification:

"The oligoester then is blended with the hydroxyalkyl (meth) acrylate, followed by addition of the diisocyanate. The resulting reaction *leads to a mixture of products*, including a species having the idealized structure (I)." (emphasis added)

The specification therefore distinguishes a resin recited in claim 1 from that disclosed in the '053 patent.

As stated in the MPEP at §2131:

"TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).... "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990)."

In view of the above, it is apparent that a difference exists between the present claims and the coating composition of the '053 patent, and, accordingly, the rejection under 35 U.S.C. §102(b) cannot be sustained. In addition, although the '053 patent may disclose a compound having the structural formula C – B – A – B – C, the '053 patent also teaches that this is the only compound prepared based on the method by which the compound is prepared and the stoichiometry of the reaction. In contrast, the present gel coat resin is made *via* a different process and yields a composition *comprising* a compound having a structure C – B – A – B – C *and other* compounds that cannot be present if prepared according to the method of the '053 patent.

In summary, it is submitted that claims 1-21 are not anticipated by the '053 patent under 35 U.S.C. §102(b) and that this rejection should be withdrawn. It also is submitted that the differences between the present claims and the '053 patent are substantial differences which preclude a rejection under 35 U.S.C. §103.

In particular, while it is true that a product-by-process claim, like claim 1, is not patentable over prior art disclosing compositions made by a different process and having the *same* structure, it also is axiomatic that structure implied by process steps should be considered when assessing the patentability of product-by-process claims over the prior art. *In re Garnero*, see MPEP §2113.

The '053 patent does not anticipate or make obvious the claimed invention because the structure implied by the product-by-process type claim 1 is different from that clearly taught by the '053 patent. Applicants do not take the position that the product-by-process claim is patentable because a different process is used. Rather, applicants demonstrate from consideration of the '053 patent and the present specification that the *structure* of the gel coat resin recited in claims 1-21 is different from the structure of the '053 patent composition.

In addition, the '053 patent provides no teaching or suggestion that the disclosed composition should be made by any other process. The '053 patent discloses no problems with the disclosed method or composition that would lead a person skilled in the art to alter the method or composition of the '053 patent and arrive at the presently claimed gel

coat composition. There is simply no apparent reason provided in the teachings or suggestions of the '053 patent that would lead a person skilled in the art to modify the '053 patent and arrive at the presently claimed invention.

In summary, it is submitted that claims 1-21 are neither anticipated by, nor obvious over, the '053 patent under U.S.C. §102(b) or §103, respectively, and that the rejection should be withdrawn.

Claims 22-25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the '053 patent in view of Bristowe U.S. Patent No. 4,213,837 ('837)). Applicants respectfully traverse this rejection.

The nonobviousness of claims 22-25 over the primary '053 reference is set forth above. The examiner relies upon the '837 patent to support a contention of obviousness because the '837 reference discloses three methods of making polyester urethane acrylates. The examiner states that a preferred method of the '837 patent "allows for a better control of the exothermic reaction, and minimizes the formation of by-products".

The '837 patent does not overcome the deficiencies of the primary '053 patent. First, the '837 patent is directed to *aromatic* polymers based on bisphenol A. The present claims, and the '053 patent, are directed to *aliphatic* polymers. The control of exotherms and avoidance of by-products referred to in the '837 patent is directed to aromatic polymers, and such a teaching is not necessarily extendable to aliphatic polymers. For example, it is well known that aliphatic hydroxy groups (e.g., alcohols) and aromatic hydroxy groups (e.g. phenols) can undergo different reactions and via different mechanisms, and can undergo similar reactions differently.

To the limited extent that the '837 patent arguably may be relevant to the present claims, it must be noted that the different blending techniques disclosed in the '837 patent to prepare the polymer *does* yield a difference in reaction products, i.e., by-product formation is affected. Therefore, contrary to the examiner's contention that the primary '053 patent teaches the same polymer as presently claimed, even though made by a different process, the '837 patent teaches that the polymer production process *does* yield different

reaction products (column 6, lines 17-26). The '837 patent also teaches that different processes may require "greater care in selecting the amounts of components" (column 6, lines 24-26), which further shows that blending techniques affect the reaction product.

In addition, applicants have further amended claims 4 and 22 to clarify that the oligoester is a condensation product of aliphatic diol(s) and aliphatic polycarboxylic compound(s). The amended claims clearly distinguish over the '837 patent, which teaches that the oligoester is made from a bisphenol A ethoxylate as polyol. The polyol of the '837 patent is an aromatic polyol, *as opposed to* an aliphatic polyol as recited in the amended claims.

The '837 patent is cited for a teaching of an alternative way to prepare a polyurethane resin, which then is combined with the '053 patent to suggest portions of the claimed invention. However, such a combination overlooks particular teachings in the '837 patent that would discourage a person skilled in the art from making the combination. For example, the '837 patent discloses particular urethane resins having specific structures of polyoxyalkylene bisphenol A polyesters, and the like. The '837 patent also appears to be directed to UV curable resins rather than the thermally curable gel coat compositions of the present claims. These and other differences illustrate that a person of skill in the art would not be motivated to combine teachings in a way leading to the presently claimed invention because of all of the other differences.

The '837 patent teaches away from modifying its disclosure to arrive at the presently recited claims. Its teaching is expressly limited to the polyol disclosed:

"It has now been discovered that *certain* vinyl ester urethanes having a *specific* number oxyalkylene units and other *specific* limitations possess a combination of excellent properties...."
(emphasis added)

col. 1, lines 58-62. Because the "excellent properties" result from "specific limitations" as described with respect to the polyol structure, a person of skill in the art would have no apparent reason to modify the '837 patent disclosure lest the excellent properties and advantages be lost.

In summary, the '837 patent is directed to aromatic polymers, and methods of preparing aromatic polymers are not necessarily the same as methods of the preparing aliphatic polymers. The '837 patent further teaches that different processes for preparing a polymer results in a *different* reaction product, which contradicts a contention that the order of addition of reactants does *not* yield different product mixtures. The '837 patent therefore fails to cure the deficiencies of the primary '053 patent. Applicants therefore respectfully submit claims 22-25 are patentable over a combination of the '053 and '837 patents which fail to teach or suggest the present invention, and that the rejection should be withdrawn.

It is submitted that all claims are in a form and scope for allowance. An early and favorable action on the merits is respectfully requested.

Should the examiner wish to discuss the foregoing, or any matter of form in an effort to advance this application toward allowance, the examiner is urged to telephone the undersigned at the indicated number.

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Respectfully submitted,

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